

Claims

1. A method for the replication by hot-embossing, hot-stamping, hot foil-stamping or plastic injection moulding of an optically variable transitory image relief pattern characterized by the use of an origination shim fabricated through a micromachining process involving successive photolithography, etch-mask layer patterning and bulk substrate etching steps.
2. A method according to claim 1 comprising bulk substrate wet chemical etching steps and wherein the bulk substrate consists of <100> oriented monocrystalline Silicon.
3. A method according to claim 1 comprising bulk substrate dry reactive-ion etching steps and wherein the bulk substrate consists of <100> or <111> oriented monocrystalline Silicon.
4. A method according to any of the preceding claims characterized by a bulk substrate consisting principally of Silicon dioxide including but not limited to glass or quartz.
5. A method according to claim 1 characterized by a bulk substrate consisting of a metal or metal alloy including but not limited to Aluminium, Copper, Steel and alloys thereof.
6. A method according to any of the preceding claims comprising a step consisting of the production of a Nickel shim obtained by copying said origination shim through successive Nickel electroforming steps.
7. A shim obtained according to any of the preceding claims.
8. A shim according to claim 7 through the use of which transitory image relief patterns displaying a contrast switch between foreground and background images when rotated through 90 at a fixed viewing angle offset to the normal can be replicated.
9. A shim according to claim 7 through the use of which a background transitory image relief pattern and a foreground transitory image relief pattern image can be replicated such that the foreground image relief pattern is hidden by the

background relief pattern, when the replicated image is tilted away from the observer.

10. A shim according to claim 7 through the use of which a background transitory image relief pattern and a foreground transitory image relief pattern image can be replicated such that the foreground transitory image relief pattern, non-apparent when viewed perpendicular to the plane of the image replica, appears against the background relief pattern, when the replicated image is tilted away from the observer.

15. A shim according to claim 7 through the use of which prism-like relief elements (PLREs) define an image, subdivided into portions composed of either of three sub-types of PLRE array; one sub-type consisting of PLREs oriented in a given direction and arranged in a row-wise staggered grid, a second sub-type consisting of PLREs rotated by 90° in the same plane as the first subtype also arranged in a row-wise staggered grid and a third subtype combining both of the first two subtypes in such a way that the PLREs defining the second subtype are placed symmetrically in the interstices formed by the first subtype. Wherein said image displays various visual contrast switching effects between the portions of the image assigned to each of the PLRE array sub-types upon,

- i) Rotation of the tilted image about the normal.
- 20 ii) Tilting of the image about the viewing angle.

25. A shim obtained according to any of the preceding claims 7 to 11 from which a marking can be replicated combining all the optically variable effects described in claims 8-11, wherein said shim is fabricated during the same series of micromachining process steps.

13. A transitory image structure characterized by the use of a shim obtained according to any of the preceding claims 7 to 12.

14. A transitory image structure according to claim 13 wherein the relief elements are defined by raised or depressed portions of a substrate.

30. 15. A transitory image structure according to claim 13 characterized by the use of a shim obtained according to any of the preceding claims wherein the relief elements are embossed in a substrate.

16. A transitory image structure according to claim 13 characterized by the use of a shim obtained according to any of the preceding claims wherein the relief elements are hot-stamped on a substrate comprising two or more distinct layers.
- 5 17. A transitory image structure according to claim 13 characterized by the use of a shim obtained according to any of the preceding claims wherein the relief elements comprise portions of ink.
- 10 18. A transitory image structure according to claim 13 characterized by the use of a shim obtained according to any of the preceding claims wherein the relief elements are intaglio printed on a substrate.
19. An object carrying a transitory image structure according to any of the preceding claims 13 to 18.
- 15 20. An object according to claim 19 obtained by plastic injection moulding incorporating a transitory image structure for which the marking and the object are fabricated during substantially the same injection moulding step.